CLAIMS

1. A method for determining the center of rotation of a bone in a revolute joint, characterized in that it includes the steps of:

displacing said bone, locating several ones of its positions, and memorizing them,

imposing a constraint to the displacement of said center of rotation without immobilizing it, and

searching a point linked to the referential of said bone for which an optimization criterion taking into account said constraint is reached.

2. The method for determining the center of rotation of a first femur with respect to the iliac bone of claim 1, characterized in that it includes the steps of:

immobilizing the second femur,

displacing the first femur and locating several ones of its positions,

searching the invariants of this displacement, taking into account the fact that the center of rotations of the first and second femurs are distant by a substantially constant length.

3. The method of claim 2, characterized in that it further includes the step of locating upon each measurement of the position of the first femur the position of the second femur to accordingly correct the position of the center of rotation between the first femur and the iliac bone.

4. The method for determining the center of rotation of a femur with respect to the iliac bone of claim 1, characterized in that it includes the steps of:

displacing the thigh so that said center of rotation moves along a trajectory which is clearly mathematically distinct from all other points of the lower femur portion,

searching this point having a specific trajectory by an optimization method.

5. The method of claim 4, characterized in that the thigh is moved so that the knee follows a loop trajectory, whereby

only the trajectory of the center of rotation will optimize a distance in the expression of which the number of loops and some of their mathematical characteristics will be involved.

6. The method for determining a the center of rotation of a femur with respect to the iliac bone of claim 4, characterized in that:

the thigh motion can be decomposed in several elementary motions,

for each elementary motion, an optimal center of rotation and an optimized distance value are calculated,

the center of rotation is statistically defined, taking into account each of the estimations of the center of rotation and of the optimized distance value, obtained based on each of the elementary motions.

7. The method for determining the center of rotation of a femur with respect to the iliac bone of claim 1, characterized in that it includes the steps of:

moving the thigh so that its lower portion describes as simple a trajectory as possible, including, in particular, no loops, so that the searched center of rotation describes a mathematically simple trajectory, and

searching this point with a mathematically simple trajectory by an optimization method.

8. The method of claim 7, characterized in that:

the thigh motion can be decomposed in several elementary motions,

for each elementary motion, an optimal center of rotation and the value of the optimized distance are calculated,

the center of rotation is statistically defined, by taking into account each of the estimations of the center of rotation and of the value of the optimized distance, obtained based on each of the elementary motions.

9. The method for determining the center of rotation of a femur with respect to the iliac bone of claim 1, characterized in that it includes the steps of:

performing a succession of elementary motions of the thigh,

for each of these motions, searching the position of the center of rotation of the femur, assuming that said femur has remained fixed, and determining a confidence ellipsoid within which the probability of presence of the femur center of rotation is high, and

calculating based on the confidence ellipsoids the position of maximum probability of the femur center of rotation.

10. The method of claim 9, characterized in that some of the elementary motions of the thigh are performed in a plane and are of small amplitude.

11. The method of claim 9, characterized in that some of the elementary motions of the thigh are performed by rotating the femur around its own axis.

12. A device for determining the center of rotation of a femur with respect to the iliac bone, characterized in that it includes:

means for locating several positions of the femur during motions thereof,

means for imposing a constraint to the motion of said center of rotation without for all this immobilizing it, and

calculation means for searching a point linked to the referential of said femur for which a minimization criterion is reached, taking said constraint into account.